

# COMBIVERT



# R6

*Regenerative systems*

**KEB**

GB

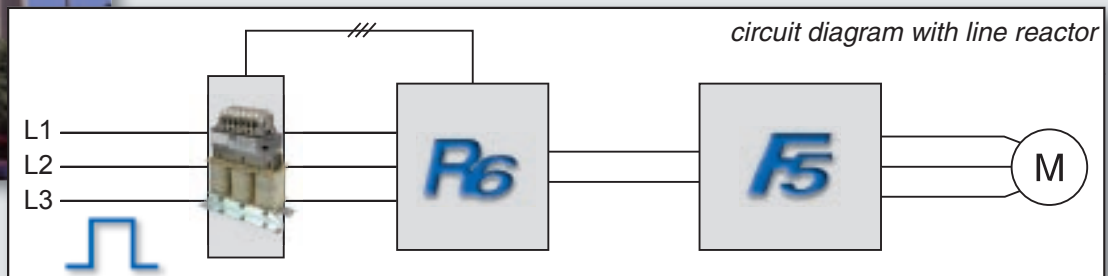
# KEB COMBIVERT R6

All moving systems have kinetic energy when in operation. Historically, that kinetic energy was eliminated through friction or a mechanical braking device.

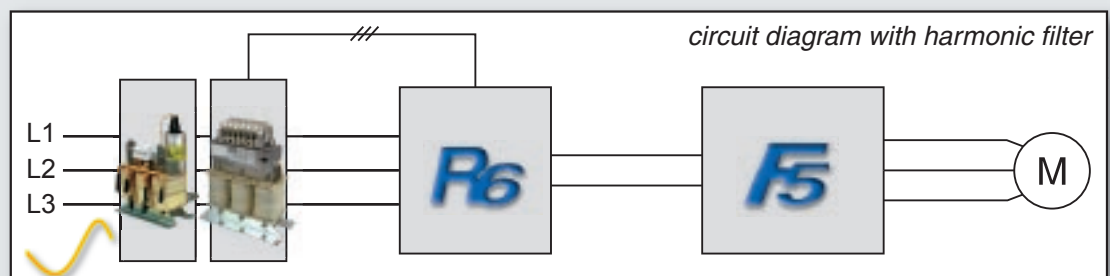
In recent years, with the advent of AC motor controls and servo systems, a new method of dissipating kinetic energy evolved. To slow a moving system down, the motor operates as a generator, and converts the mechanical energy back into electrical energy. This electrical energy is then shunted into what is typically referred to as a braking resistor.

Thus the system's kinetic energy is turned into heat. In many applications, this is sufficient. However some applications, due to the large moving mass and/or high efficiency, produce almost as much return energy as they take in from the utility.

In these applications the braking resistors can become quite large, produce tremendous amounts of heat, and make operation of the system expensive. As a result KEB saw the need to develop a better solution.



In combination with the KEB COMBILINE harmonic filters the KEB COMBIVERT R6-units enable sinusoidal feed-back.



**Energy saving by using the feed-back –  
an environmental contribution that pays off!**

## The new technical solution for

### Passenger lifts and freight elevators

- replacement of traditional braking resistors
- amortization through energy saving possible after less than 2 years of operating time
- **reduced** fire hazard of the system



### Lifting- and conveying systems / storage techniques

- connection of drives possible in DC-interconnected operation, with energy compensation and feed-back of the load peaks into the mains power supply
- no heat source mounted on the traversing unit



### Theatre technology

- no heating through resistors
- energy optimization of the system
- low-noise braking operation

### Test systems

- continuous energy feed-back
- cascadable for high ratings

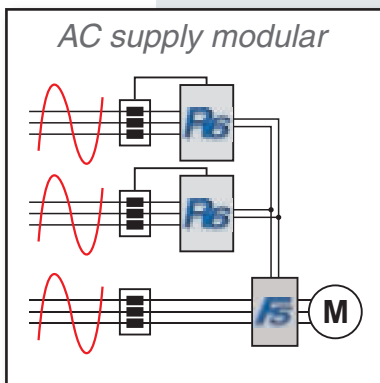
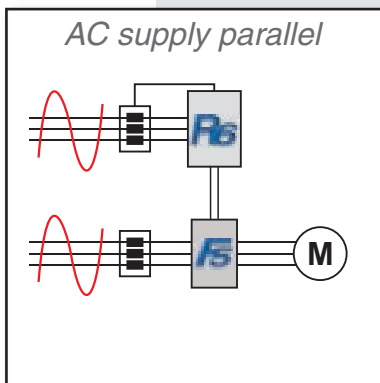
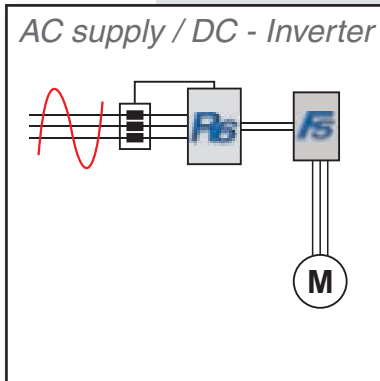
### Decentral power supply solutions

- international standards (e.g.: IEEE-519 / THD I < 8%) can be met with harmonic filters



# KEB COMBIVERT R6

The **block-shaped feed-back produced** is usable with single units or in modular configuration.



## System characteristics KEB COMBIVERT R6

- high capacity for DC connection of inverters and servo controllers
- complete system available from KEB: unit / commutation choke / EMC filter, class A
- high overall efficiency gives optimum use of the kinetic energy
- indication of feed-in rating, feed-back rating and overall balance gives a general view of the economic efficiency of the system
- compact, modular design permits optimal system integration or retrofitting of existing plants
- universal suitability for all popular supply voltages from 200 V ... 500 V AC, 50/60 Hz
- integrated DC fuse reduces external wiring / installation costs
- digital control and serial connection available

KEB-HSP 5 / DIN 66019-II

**CANopen**

**DeviceNet**

**EtherCAT**

**ETHERNET POWERLINK**

**MODBUS**

**SERCOS interface**

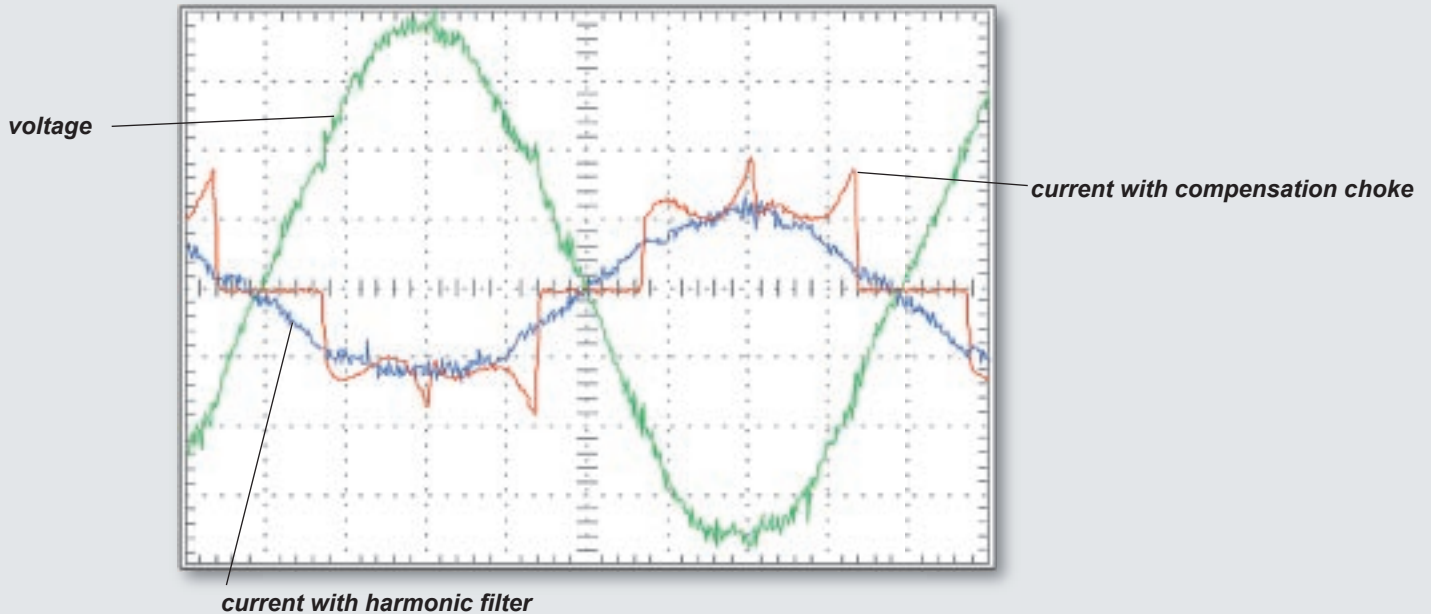
**PROFIBUS**

**PROFINET**

**Ethernet TCP/IP**

**INTERBUS**

## Voltage- / current diagram in regen operation



For the integration into the system controller, the KEB COMBIVERT R6 has both serial communication and free programable analog/digital in- and outputs.

- 4 x digital in
- 2 x digital out
- 2 x relay out
- 1 x analog out



Easy handling is ensured through the factory-provided short menu (CP-Parameter).

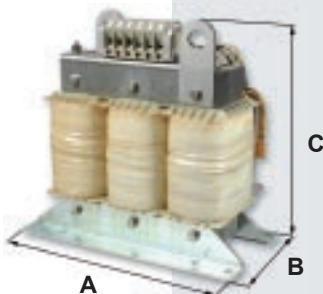
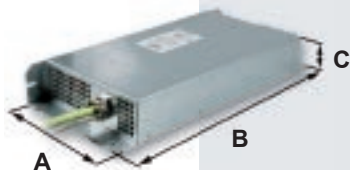
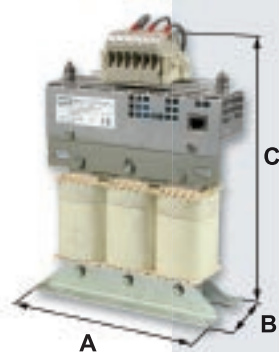
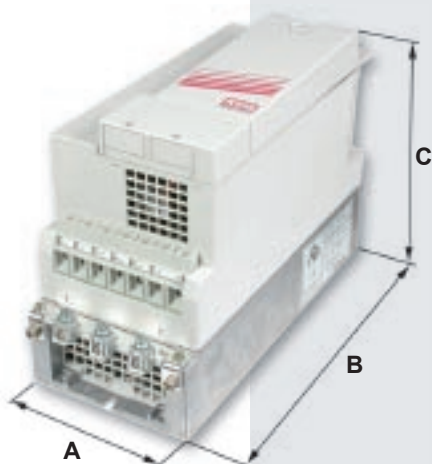
More individual adjustments are possible in the application level.

The universal PC tool KEB COMBIVIS offers a user friendly programming and monitoring platform for an easy start-up, diagnosis or maintenance.

The download is free-of-charge under [www.keb.de](http://www.keb.de).

# KEB COMBIVERT R6

## Technical data



Supply- and regenerative units			
Part-No.		15.R6.S3E-900A	19.R6.S3E-900A
Phases		3	
Rated voltage *	[V]	400 (230)	
Mains voltage	[V]	180...550 ±0 %	
Mains frequency	[Hz]	50 / 60 ±2	
Regeneration			
Rated output power *	[kVA]	18 (10.5)	45 (26)
Rated active power *	[kW]	17 (10)	42 (23)
Max. output power *	[kVA]	27 (15.5)	67.5 (39)
Max. active power *	[kW]	25.5 (15)	63 (34.5)
Regenerative rated current	[A]	26	65
Regenerative DC current	[A <sub>DC</sub> ]	32	80
Over load current (E.OL) 60s	[A]	39	97.5
Max. regenerative DC current 60 s	[A <sub>DC</sub> ]	48	120
Supply			
Rated output power *	[kVA]	18 (10.5)	48.5 (28)
Rated active power *	[kW]	16 (10)	44.5 (25.5)
Max. output power *	[kVA]	27 (15.5)	72.5 (42)
Max. active power *	[kW]	24 (14.5)	67 (38)
Supply rated current (g = 0.95)	[A]	26	70
DC supply current	[A <sub>DC</sub> ]	32	87
Over load current (E.OL)	[A]	39	105
Max. DC supply current	[A <sub>DC</sub> ]	48	130
OC-tripping current	[A]	56	150
Dimensions (A x B x C)	[mm]	130 x 290 x 208	
Weight	[kg]	5.6	

\* The values in brackets apply to the operation on 230 V power supply.

Commutation choke	Part-No.	15.Z1.B05-1000	19.Z1.B05-1000
Rated current	[A]	26	70
Overload	[%]	150	
Dimensions (A x B x C)	[mm]	180 x 75 x 240	243 x 115 x 290
Weight	[kg]	5.6	13.7
EMC filter (submounted)	Part-No..	15.E4.T60-1001	19.R6.T60-1001
Dimensions (A x B x C)	[mm]	132 x 352 x 50	198 x 422 x 65
Weight	[kg]	2.6	6
Harmonic filter THD ≤ 8%	Part-No..	15.Z1.C04-1000	19.Z1.C04-1000
Dimensions (A x B x C)	[mm]	291 x 214 x 257	352 x 307 x 326
Weight	[kg]	25.5	63

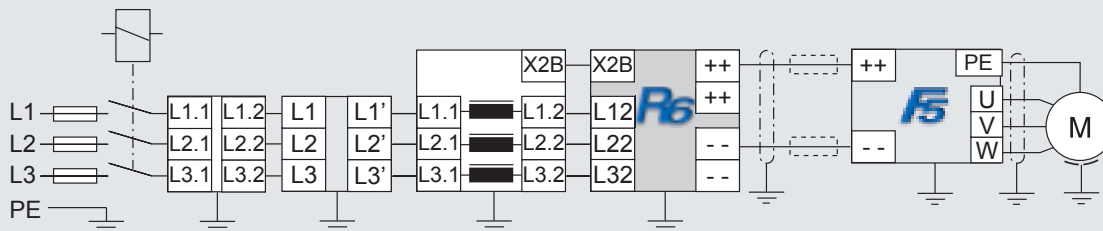
Synchronization cable 1m, part-no. **00.F5.0C3 – 4010**

Preassembled cable assembly on both sides RJ45, direct connection between commutation reactor – regenerative unit



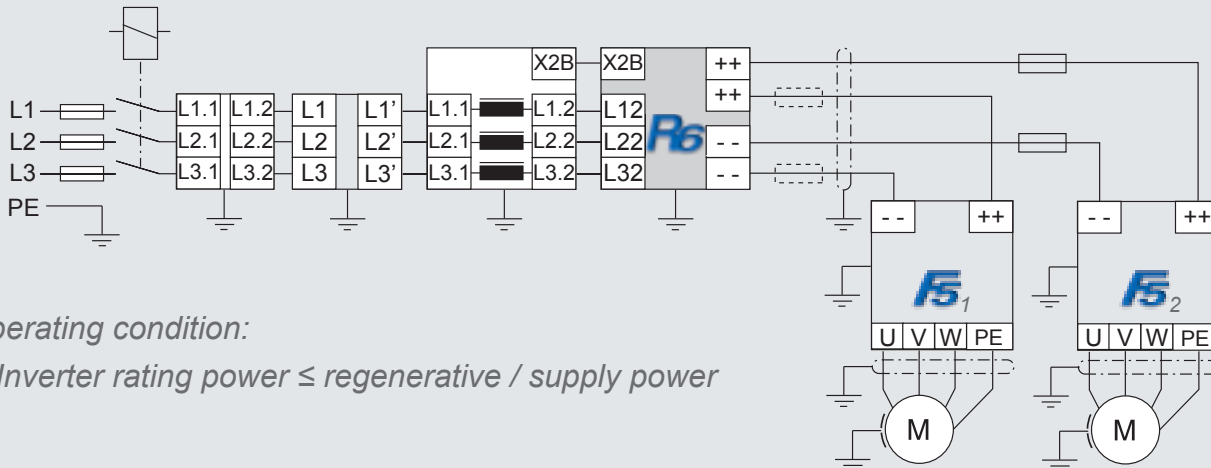
## Type of connections

- **Supply / regenerative operation with DC-supplied drives – single drive**



Operating condition:  $\text{Inverter rating power} \leq \text{regenerative / supply power}$

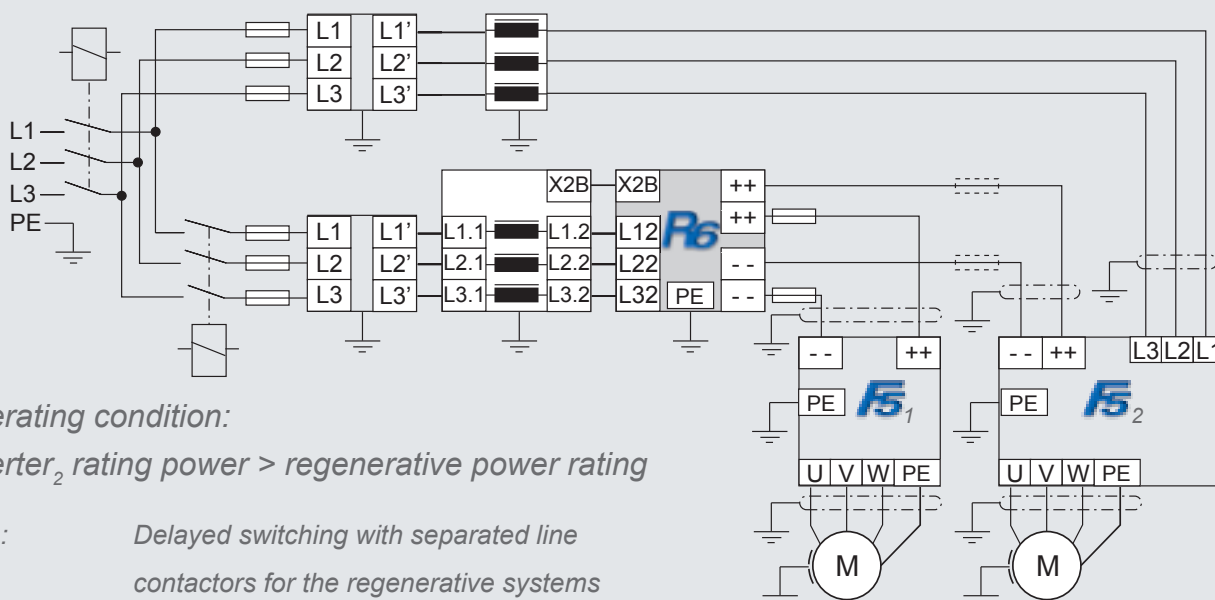
- **Supply / regenerative operation with DC-supplied drives – multi-axle application**



Operating condition:

$\sum \text{Inverter rating power} \leq \text{regenerative / supply power}$

- **Parallel supply of drives – regenerative operation**



Operating condition:

$\text{Inverter}_2 \text{ rating power} > \text{regenerative power rating}$

Note: Delayed switching with separated line contactors for the regenerative systems  
or: Use of decoupling diodes

# people in motion



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